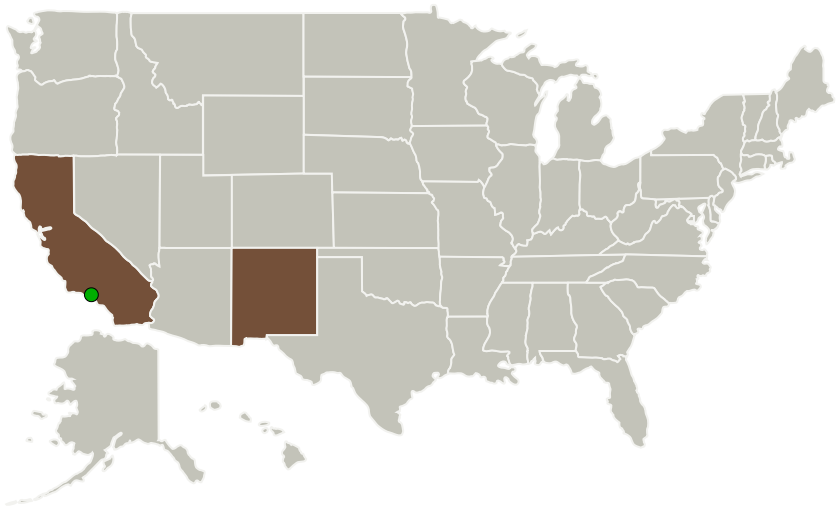
Inexpensive Compact Sensor for In Situ Sulfur Dioxide Measurement in Volcanic Gas Plumes, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Volcanic research is a significant part of the "Earth Surface & Interior" focus area of the NASA Earth Science program. Of particular interest are sensors for measuring the chemical composition and emission rate of gases released by volcanoes, from magma to the atmosphere, both prior to and during eruptions. The vast majority of ground based plume observations concern sulfur dioxide (SO2), the third most abundant volcanic gas. Sulfur dioxide measurements provide valuable information concerning the masses and motions of underground magmas. Vista Photonics proposes an innovative self-calibrating optical technology for sensitive and selective in situ measurement of SO2 in volcanic gas plumes. The self-calibrating feature is intended to maintain the specified performance characteristics under harsh operating conditions. Phase I research will focus on demonstrating the feasibility of the innovative SO2 detector and outline the design of the Phase II prototype instrument. Successful completion of this program will lead to development of an inexpensive, compact, self-contained, lightweight SO2 measurement instrument suitable for use on a variety of ground based and airborne platforms including remotely operated aircraft and surface craft.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Vista Photonics, Inc.	Lead Organization	Industry	Santa Fe, New Mexico
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	New Mexico

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138645)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Vista Photonics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

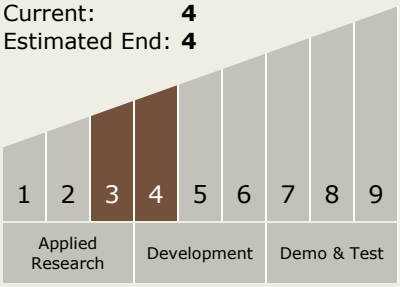
Carlos Torrez

Principal Investigator:

Andrei Vakhtin

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.2 Atomic and Molecular Species Assessment

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System